

**Notice of Allowability****Application No.**

10/658,912

**Applicant(s)**

IYER ET AL.

**Examiner**

PHILIP J. CHEA

**Art Unit**

2453

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed September 8, 2008.
2. ☒ The allowed claim(s) is/are 1,3-11,13,14,16-24,26-34 and 36-43.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of the:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached  
1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.  
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date 20081124.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

/Moustafa M Meky/  
Primary Examiner, Art Unit 2457

#### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Adam Stone on November 5, 2008.

The application has been amended as follows:

**IN THE CLAIMS:**

Please see attached.

2. The following is an examiner's statement of reasons for allowance: The prior art does not teach nor render obvious each and every limitation of the claimed invention. Specifically, as per claims 1,14,24,34, the prior art fails to teach selecting, based on the callback registration information, one of the several network device operating system components that can process the identified network device operating system operation and receiving responsive data that reflects the results of performing said identified network device operating system operation from the selected one of the several network device operating system components. As per claim 11, the prior art fails to teach selecting, based on the callback registration information, one of the several network device operating system components that can process the identified network device operating system operation and component XML logic that implements one or more of the callbacks to which the identified network device operating system operation and the prepared data are provided by the programmatic agent infrastructure logic.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHILIP J. CHEA whose telephone number is (571)272-3951. The examiner can normally be reached on M-F 6:30-4:00 (1st Friday Off).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on 571-272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Philip J Chea  
Examiner  
Art Unit 2453

/Moustafa M Meky/  
Primary Examiner, Art Unit 2457

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1. (Currently amended) A method of processing a network device operating system operation, the method comprising the computer-implemented steps of:  
receiving, from each of several network device operating system components, callback registration information that specifies the network device operating system operations supported by the network device operating system component and that establishes a callback for providing (a) a network device operating system operation and (b) data associated with the operation to the network device operating system component;  
receiving (a) the network device operating system operation and (b) data associated with the operation within an Extensible Markup Language (XML) document;  
parsing the XML document to identify the network device operating system operation;  
selecting, based on the callback registration information, one of the several network device operating system components that supports the identified network device operating system operation, where the callback registration information received from the selected one of several network device operating system components specifies that the identified network device operating system operation is supported by the selected one of several network device operating system components;  
preparing the data associated with the operation for use by the selected one of several network device operating system component; [[and]]  
providing the identified network device operating system operation and the prepared data in the ~~callback established by the selected network device operating system component;~~  
receiving, from the selected one of the several network device operating system components, responsive data that reflects the results of performing the identified network device operating system operation;  
creating a responsive XML document that contains the responsive data in XML format; and  
sending the responsive XML document to a network management application.
2. (Canceled)
3. (Original) The method of Claim 1, wherein the XML document is received within a transport protocol message that conforms to one of several transport protocols, and further comprising the step of extracting the XML document from the transport protocol message.
4. (Original) The method of Claim 1, further comprising the steps of:  
at the selected one of the several network device operating system components, processing the identified network device operating system operation in preparation for invoking a function that can perform one or more tasks associated with the operation; and

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invoking the function defined by the network device operating system component that can perform the one or more tasks associated with the operation.

5. (Previously Presented) The method of Claim 4, wherein the XML document includes data associated with the network device operating system operation, and wherein the step of processing the identified network device operating system operation in preparation for invoking the function comprises:  
validating the data associated with the network device operating system operation; and  
mapping the data to one or more data structures that are associated with the function.
6. (Previously presented) The method of Claim 1, further comprising the steps of:  
receiving, in the XML document, a query from a network management application about the several network device operating system components that are supported; and  
providing a response to the network management application that identifies one or more of the several network device operating system components that are supported.
7. (Original) The method of Claim 1, further comprising the steps of:  
receiving, in the XML document, a query from a network management application about one or more of several objects that are supported by the several components; and  
providing a response to the network management application that identifies one or more of the objects that are supported.
8. (Previously Presented) The method as recited in Claim 7, further comprising the steps of:  
receiving, in the XML document, a query from a network management application about one or more of several methods that are supported by the objects; and  
providing a response to the network management application that identifies one or more of the methods that are supported.
9. (Original) The method as recited in Claim 7, further comprising the steps of:  
receiving, in the XML document, a query from a network management application about one or more of several attributes that are supported by the methods; and  
providing a response to the network management application that identifies one or more of the attributes that are supported.
10. (Original) The method as recited in Claim 1, further comprising the steps of:  
receiving, in the XML document, an invocation by a network management application of one or more of several methods that are implemented by one or more objects of the several components; and

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invoking the one or more methods through a callback to one or more of the components.

11. (Currently amended) A computer-readable storage medium for processing a network operating system operation for a network device, comprising:
- a plurality of network device operating system components comprising instructions for performing network device operating system operations;
  - XML infrastructure logic comprising instructions for receiving (a) a network operating system operation and (b) data associated with the operation within an Extensible Markup Language (XML) document; and
  - programmatic agent infrastructure logic comprising instructions for:
    - receiving, from each of several network device operating system components, callback registration information that specifies the network device operating system operations supported by the network device operating system component and that establishes a callback for providing (a) the network device operating system operation and (b) data associated with the operation to the network device operating system component,
    - parsing the XML document to identify the network device operating system operation, selecting one of the several network device operating system components that supports the identified network device operating system operation, where the callback registration information received from the selected one of several network device operating system components specifies that the identified network device operating system operation is supported by the selected one of several network device operating system components,
    - preparing the data associated with the operation for use by the selected one of several network device operating system component, and
    - providing the identified network device operating system operation and the prepared data in the callback established by the selected network device operating system component; and
- wherein each of the network device operating system components comprises component XML logic that implements one or more of the callbacks to which the identified network device operating system operation and the prepared data are provided by the programmatic agent infrastructure logic and component API logic that provides an application programming interface for one or more functions of the network device operating system component.

12. (Canceled)

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13. (Currently amended) The computer-readable storage medium as recited in Claim 11[[12]], wherein the component XML logic further comprises instructions for data validation of the data associated with the identified network device operating system operation and for mapping the data to one or more data structures that are associated with the one or more functions.
14. (Currently amended) A computer-readable storage medium storing one or more sequences of instructions for processing a network device operating system operation, which instructions, when executed by one or more processors, cause the one or more processors to perform the steps of: receiving, from each of several network device operating system components, callback registration information that specifies the network device operating system operations supported by the network device operating system component and that establishes a callback for providing (a) a network device operating system operation and (b) data associated with the operation to the network device operating system component; receiving (a) the network device operating system operation and (b) data associated with the operation within an Extensible Markup Language (XML) document; parsing the XML document to identify the network device operating system operation; selecting, based on the callback registration information, one of the several network device operating system components that supports the identified network device operating system operation, where the callback registration information received from the selected one of several network device operating system components specifies that the identified network device operating system operation is supported by the selected one of several network device operating system components; preparing the data associated with the operation for use by the selected one of several network device operating system component; and providing the identified network device operating system operation and the prepared data in the callback established by the selected network device operating system component; receiving, from the selected one of the several network device operating system components, responsive data that reflects the results of performing the identified network device operating system operation; creating a responsive XML document that contains the responsive data in XML format; and sending the responsive XML document to a network management application.
15. (Canceled)
16. (Previously Presented) The computer-readable storage medium as recited in Claim 14, wherein the XML document is received within a transport protocol message that conforms to one of several transport protocols, and further comprising instructions, which when executed by the one

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or more processors, cause the one or more processors to perform the step of extracting the XML document from the transport protocol message.

17. (Previously Presented) The computer-readable storage medium as recited in Claim 14, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:  
at the selected one of the several network device operating system components, processing the identified network device operating system operation in preparation for invoking a function that can perform one or more tasks associated with the operation; and  
invoking the function defined by the network device operating system component that can perform the one or more tasks associated with the operation.
18. (Previously Presented) The computer-readable storage medium as recited in Claim 17, wherein the XML document includes data associated with the network device operating system operation, and wherein the step of processing the identified network device operating system operation in preparation for invoking the function comprises:  
validating the data associated with the network device operating system operation; and  
mapping the data to one or more data structures that are associated with the function.
19. (Previously presented) The computer-readable storage medium as recited in Claim 14, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:  
receiving, in the XML document, a query from a network management application about the several network device operating system components that are supported; and  
providing a response to the network management application that identifies one or more of the several network device operating system components that are supported.
20. (Previously Presented) The computer-readable storage medium as recited in Claim 14, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:  
receiving, in the XML document, a query from a network management application about one or more of several objects that are supported by the several components; and  
providing a response to the network management application that identifies one or more of the objects that are supported.



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21. (Previously Presented) The computer-readable storage medium as recited in Claim 20, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
- receiving, in the XML document, a query from a network management application about one or more of several methods that are supported by the objects; and
- providing a response to the network management application that identifies one or more of the methods that are supported.
22. (Previously Presented) The computer-readable storage medium as recited in Claim 20, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
- receiving, in the XML document, a query from a network management application about one or more of several attributes that are supported by the methods; and
- providing a response to the network management application that identifies one or more of the attributes that are supported.
23. (Previously Presented) The computer-readable storage medium as recited in Claim 14, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
- receiving, in the XML document, an invocation by a network management application of one or more of several methods that are implemented by one or more objects of the several components; and
- invoking the one or more methods through a callback to one or more of the components.
24. (Currently amended) An apparatus for processing a network device operating system operation, comprising:
- at least one processor;
- means for receiving, from each of several network device operating system components, callback registration information that specifies the network device operating system operations supported by the network device operating system component and that establishes a callback for providing (a) a network device operating system operation and (b) data associated with the operation to the network device operating system component;
- means for receiving (a) the network device operating system operation and (b) data associated with the operation within an Extensible Markup Language (XML) document;
- means for parsing the XML document to identify the network device operating system operation;
- means for selecting, based on the callback registration information, one of the several network device operating system components that supports the identified network device

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operating system operation, where the callback registration information received from the selected one of several network device operating system components specifies that the identified network device operating system operation is supported by the selected one of several network device operating system components;

means for preparing the data associated with the operation for use by the selected one of several network device operating system component; and

means for providing the identified network device operating system operation and the prepared data in the callback established by the selected network device operating system component;

means for receiving, from the selected one of the several network device operating system components, responsive data that reflects the results of performing said identified network device operating system operation;

means for creating a responsive XML document that contains the responsive data in XML format;  
and

means for sending the responsive XML document to a network management application.

25. (Canceled)
26. (Previously Presented) The apparatus of Claim 24, wherein the XML document is received within a transport protocol message that conforms to one of several transport protocols, and further comprising means for extracting the XML document from the transport protocol message.
27. (Previously Presented) The apparatus of Claim 24, further comprising:  
means for processing the identified network device operating system operation in preparation for invoking a function that can perform one or more tasks associated with the operation; and  
means for invoking the function defined by the network device operating system component that can perform the one or more tasks associated with the operation.
28. (Previously Presented) The apparatus of Claim 27, wherein the XML document includes data associated with the network device operating system operation, and wherein the means for processing the identified network device operating system operation in preparation for invoking the function comprises:  
means for validating the data associated with the network device operating system operation; and  
means for mapping the data to one or more data structures that are associated with the function.
29. (Previously presented) The apparatus of Claim 24, further comprising:

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means for receiving, in the XML document, a query from a network management application about the several network device operating system components that are supported; and  
means for providing a response to the network management application that identifies one or more of the several network device operating system components that are supported.

30. (Previously Presented) The apparatus of Claim 24, further comprising:  
means for receiving, in the XML document, a query from a network management application about one or more of several objects that are supported by the several components; and  
means for providing a response to the network management application that identifies one or more of the objects that are supported.
31. (Previously Presented) The apparatus of Claim 30, further comprising the steps of:  
means for receiving, in the XML document, a query from a network management application about one or more of several methods that are supported by the objects; and  
means for providing a response to the network management application that identifies one or more of the methods that are supported.
32. (Previously Presented) The apparatus of Claim 30, further comprising the steps of:  
means for receiving, in the XML document, a query from a network management application about one or more of several attributes that are supported by the methods; and  
means for providing a response to the network management application that identifies one or more of the attributes that are supported.
33. (Previously Presented) The apparatus of Claim 24, further comprising:  
means for receiving, in the XML document, an invocation by a network management application of one or more of several methods that are implemented by one or more objects of the several components; and  
means for invoking the one or more methods through a callback to one or more of the components.
34. (Currently amended) An apparatus for processing a network device operating system operation, comprising:  
a network interface that is coupled to a data network for receiving one or more packet flows therefrom;  
a processor; and  
one or more stored sequences of instructions which, when executed by the processor, cause the processor to perform the steps of:

receiving, from each of several network device operating system components, callback registration information that specifies the network device operating system operations supported by the network device operating system component and that establishes a callback for providing (a) a network device operating system operation and (b) data associated with the operation to the network device operating system component;

receiving (a) the network device operating system operation and (b) data associated with the operation within an Extensible Markup Language (XML) document;

parsing the XML document to identify the network device operating system operation;

selecting, based on the callback registration information, one of the several network device operating system components that supports the identified network device operating system operation, where the callback registration information received from the selected one of several network device operating system components specifies that the identified network device operating system operation is supported by the selected one of several network device operating system components;

preparing the data associated with the operation for use by the selected one of several network device operating system component; [[and]]

providing the identified network device operating system operation and the prepared data in the callback established by the selected network device operating system component;

receiving responsive data that reflects the results of performing said identified network device operating system operation from the selected one of the several network device operating system components;

creating a responsive XML document that contains the responsive data in XML format;  
and

sending the responsive XML document to a network management application.

35. (Canceled)
36. (Original) The apparatus of Claim 34, wherein the XML document is received within a transport protocol message that conforms to one of several transport protocols, and further comprising instructions, which when executed by the processor, cause the processor to perform the step of extracting the XML document from the transport protocol message.
37. (Original) The apparatus of Claim 34, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:

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at the selected one of the several network device operating system components, processing the identified network device operating system operation in preparation for invoking a function that can perform one or more tasks associated with the operation; and invoking the function defined by the network device operating system component that can perform the one or more tasks associated with the operation.

38. (Previously Presented) The apparatus of Claim 37, wherein the XML document includes data associated with the network device operating system operation, and wherein the step of processing the identified network device operating system operation in preparation for invoking the function comprises:  
validating the data associated with the network device operating system operation; and mapping the data to one or more data structures that are associated with the function.
39. (Previously presented) The apparatus of Claim 34, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:  
receiving, in the XML document, a query from a network management application about the several network device operating system components that are supported; and providing a response to the network management application that identifies one or more of the several network device operating system components that are supported.
40. (Original) The apparatus of Claim 34, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:  
receiving, in the XML document, a query from a network management application about one or more of several objects that are supported by the several components; and providing a response to the network management application that identifies one or more of the objects that are supported.
41. (Previously Presented) The apparatus of Claim 40, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:  
receiving, in the XML document, a query from a network management application about one or more of several methods that are supported by the objects; and providing a response to the network management application that identifies one or more of the methods that are supported.
42. (Original) The apparatus of Claim 40, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:

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receiving, in the XML document, a query from a network management application about one or more of several attributes that are supported by the methods; and  
providing a response to the network management application that identifies one or more of the attributes that are supported.

43. (Original) The apparatus of Claim 34, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:  
receiving, in the XML document, an invocation by a network management application of one or more of several methods that are implemented by one or more objects of the several components; and  
invoking the one or more methods through a callback to one or more of the components.